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Mats Dahlback

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ZHU, WEIPING

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MATS DAHLBACK

Appeal 2010-001433
Application 10/538,973
Technology Center 1700

Before ADRIENE LEPIANE HANLON, CHUNG K. PAK, and
PETER F. KRATZ, *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 18 through 21, 23, and 31, all of the claims pending in the above-identified application.¹ We have jurisdiction under 35 U.S.C. § 6.

STATEMENT OF THE CASE

Details of the appealed subject matter are recited in representative claims 18 and 31 reproduced from the Claims Appendix to the Appeal Brief as shown below:

¹ See the Appeal Brief ("App. Br.") filed May 5, 2009, the Examiner's Answer ("Ans.") filed July 15, 2009, and the Reply Brief ("Reply Br.") filed August 27, 2009.

18. A method of producing and treating a sheet suited to be used as a component or as a part of a component in a fuel assembly for a nuclear light water boiling water reactor, which method comprises the following steps:

a) producing a sheet of a Zr-based alloy by forging, hot rolling and cold rolling in a suitable number of steps, wherein said alloy contains at least about 96 weight percent Zr;

b) carrying out one of an $\alpha+\beta$ quenching and a β quenching of the sheet when the sheet has been produced to a thickness which is one of equal to the final thickness of the finished sheet and approximately equal to the final thickness of the finished sheet;

c) heat treating of the sheet in the (χ -phase temperature range of said alloy, wherein step c) is carried out after steps a) and b) have been carried out, and wherein

the sheet is stretched during the heat treatment according to step c);

wherein said stretching and said heat treatment during step c) are carried out in a continuous oven process;

wherein said stretching is carried out such that the sheet directly after having gone through the stretching has a remaining elongation compared to the state of the sheet immediately before the stretching;

wherein said remaining elongation is between about 0.1% and about 7%; and

wherein said component defines a longitudinal direction which, when the component is used in said fuel assembly, is at least substantially parallel to a longitudinal direction of the fuel assembly and wherein said stretching of the sheet is carried out in a direction which corresponds to the longitudinal direction of said component for which the sheet is intended.

31. A method of producing and treating a sheet suited to be used as a component or as a part of a component in a fuel assembly for a nuclear light water boiling water reactor, which method comprises the following steps:

a) producing a sheet of a Zr-based alloy by forging, hot rolling and cold rolling in a suitable number of steps, wherein said alloy contains at least about 96 weight percent Zr;

b) carrying out one of an $\alpha+\beta$ quenching and a β quenching of the sheet when the sheet has been produced to a thickness which is one of equal to the final thickness of the finished sheet and approximately equal to the final thickness of the finished sheet;

c) heat treating of the sheet in the (χ -phase temperature range of said alloy, wherein step c) is carried out after steps a) and b) have been carried out, and wherein the sheet is stretched during the heat treatment according to step c);

wherein said stretching and said heat treatment during step c) are carried out in a continuous oven process;

wherein said stretching is carried out such that the sheet directly after having gone through the stretching has a remaining elongation compared to the state of the sheet immediately before the stretching; and

wherein said remaining elongation is between about 0.2% and about 4%; and

wherein said component defines a longitudinal direction which, when the component is used in said fuel assembly, is at least substantially parallel to a longitudinal direction of the fuel assembly and wherein said stretching of the sheet is carried out in a direction which corresponds to the longitudinal direction of said component for which the sheet is intended.

As evidence of unpatentability of the claimed subject matter, the Examiner relies upon the following prior art references (Ans. 2):

Dahlback	6,149,738	Nov. 21, 2000
Garzarolli	6,167,104	Dec. 26, 2000

Appellant seeks review of the Examiner's rejection of claims 18 through 21, 23, and 31 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Dahlback and Garzarolli (App. Br. 3-4).

FACTUAL FINDINGS, PRINCIPLES OF LAW, ISSUE, ANALYSIS,
AND CONCLUSION

Appellant does not dispute the Examiner's finding that:

Dahlback ('738) discloses a method of producing and treating a sheet [forming] for a component in a fuel assembly [i.e., a fuel box] for a nuclear light water reactor [i.e., a boiling water reactor] comprising (col. 4, line 65 to col. 5, line 42):

producing a sheet of a Zr-base alloy by forging, hot-rolling and cold-rolling in a number of steps, wherein said alloy contains by weight at least about 96% of Zr;

carrying out a β quenching when the sheet has been produced in the finished dimension or almost finished dimension; and

heat treating the sheet after the β quenching in a temperature range of 600-800°C (i.e. the α -phase temperature range of the alloy). [(Compare Ans. 3 with App. Br. 4-12 and Reply Br. 2-4.)]

Nor does Appellant dispute the Examiner's finding that the purpose of the heat treatment of Dahlback is to improve corrosion properties and to restore the flatness of the sheet. (Compare Ans. 3 with App. Br. 6.) Rather, Appellant contends that the collective teachings of the prior art references relied upon by the Examiner would not have led one of ordinary skill in the art to stretch or lengthen the sheet during the heat treatment of the sheet at

the α -phase temperature in the sheet making process of Dahlback (App. Br. 4-11 and Reply Br. 2-4).

Thus, the dispositive question is: Has the Examiner demonstrated that the collective teachings of the prior art references relied upon would have led one of ordinary skill in the art to stretch (lengthen and straighten) the sheet during the heat treatment of the sheet at the α -phase temperature in the sheet making process of Dahlback within the meaning of 35 U.S.C. § 103(a)? On this record, we answer this question in the negative.

As correctly asserted by Appellant at pages 4 through 11 of the Appeal, the Examiner has not shown that Garzaolli's stretching (lengthening and straightening) step useful for imparting internal stresses to a guide tube for a pressurized water reactor (PWR) fuel assembly is also useful for a sheet for forming a fuel box in a boiling water reactor (BWR). In other words, the Examiner has not shown or explained why one of ordinary skill in the art would have been led to stretch (lengthen and straighten) or provide internal stresses to a sheet for forming a fuel box used in a boiling water reactor fuel assembly.

Even if such stretching step could be used to lengthen and straighten a sheet used for a boiling water reactor (BWR) fuel box as proposed by the Examiner at pages 3 through 6 of the Answer, the proposed combination would not result in the claimed invention. As also correctly asserted by Appellant at pages 6 through 11 of the Appeal Brief and pages 3 and 4 of the Reply Brief, the Examiner has not shown that such stretching step could be used during the heat treatment of the sheet at the α -phase temperature. On

this record, the Examiner has not shown that the heat treatment temperature taught by Dahlback is useful for Garzaolli's stretching (lengthening and straightening) step for the purpose of providing internal stresses (Ans. 3-6). Nor has the Examiner shown that Garzaolli teaches or suggests that its stretching (lengthening and straightening) step can be carried out at the heat treatment temperature taught by Dahlback (Ans. 3-6).

Accordingly, based on the totality of record, including due consideration of the arguments advanced by the Examiner and Appellant, we determine that the Examiner has not established a prima facie case of obviousness within the meaning of 35 U.S.C. § 103(a).

ORDER

Upon consideration of the record, it is

ORDERED that the decision of the Examiner to reject claims 18 through 21, 23, and 31 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Dahlback and Garzarolli is REVERSED.

REVERSED

sld

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